

Heights of rivers referred to zeros of gages—Continued.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
<i>James River.</i>	<i>Miles.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>	<i>Feet.</i>
Lynchburg, Va. <sup>13</sup> .....	257	18	1.6	13	0.0	1-3, 8-11	0.4	1.6
Richmond, Va. <sup>1</sup> .....	110	12	0.9	24	- 2.8	28	-1.3	3.7
<i>Roanoke River.</i>								
Weldon, N. C. ....	90	40	11.9	14	6.9	31	8.5	5.0
<i>Cape Fear River.</i>								
Fayetteville, N. C. ....	100	38	14.0	14	4.0	13, 22	6.4	10.0
<i>Lumber River.</i>								
Fairbluff, N. C. ....	10	6	4.1	10-12	2.9	1	3.5	1.2
<i>Edisto River.</i>								
Edisto, S. C. ....	75	17	5.3	1	4.1	23-28	4.5	1.2
<i>Pedee River.</i>								
Cheraw, S. C. ....	145	27	9.0	14	1.2	11	3.0	7.8
<i>Black River.</i>								
Kingstree, S. C. ....	60	12	5.3	22, 23	3.7	29	4.6	1.6
<i>Lynch Creek.</i>								
Effingham, S. C. ....	35	12	8.3	6	4.8	26	6.1	3.5
<i>Santee River.</i>								
St. Stephens, S. C. ....	50	12	7.3	19, 20, 31	1.8	13	5.4	5.5
<i>Congaree River.</i>								
Columbia, S. C. ....	37	15	4.2	25	0.0	10	0.9	4.2
<i>Wateree River.</i>								
Camden, S. C. ....	45	24	17.4	14	3.3	11	6.2	14.1
<i>Waccamaw River.</i>								
Conway, S. C. ....	40	7	2.6	24	1.3	1	2.1	1.8
<i>Savannah River.</i>								
Calhoun Falls, S. C. ....	347	.....	5.0	13	2.4	10	3.2	2.6
Augusta, Ga. ....	268	82	14.5	14	6.0	9, 10	8.1	8.5
<i>Broad River.</i>								
Carlton, Ga. ....	30	.....	4.4	24	2.2	7-11, 23	2.6	2.2
<i>Flint River.</i>								
Albany, Ga. ....	80	30	5.1	31	3.1	21	4.0	2.0

Heights of rivers referred to zeros of gages—Continued.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
<i>Chattahoochee River.</i>	<i>Miles.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>	<i>Feet.</i>
West Point, Ga. ....	239	20	6.0	24	2.4	11	3.6	3.6
<i>Coosa River.</i>								
Rome, Ga. ....	225	30	7.5	25	0.8	8-11	2.5	6.7
Gadsden, Ala. ....	144	18	10.8	13	- 0.2	9, 10	3.4	11.0
<i>Alabama River.</i>								
Montgomery, Ala. ....	265	25	15.6	13	1.0	10	6.7	14.6
Selma, Ala. ....	212	33	17.8	15	1.3	9, 10	7.1	16.5
<i>Tombigbee River.</i>								
Columbus, Miss. ....	285	33	18.4	12	- 2.9	9	4.7	16.3
Demopolis, Ala. ....	155	35	29.2	17	- 0.8	10	14.4	30.0
<i>Black Warrior River.</i>								
Tuscaloosa, Ala. ....	90	43	39.5	13	0.6	9, 10	12.8	38.9
<i>Columbia River.</i>								
Umatilla, Oreg. ....	270	25	7.5	4	5.1	22	6.0	2.4
The Dalles, Oreg. ....	166	40	11.9	3	7.2	23	9.1	4.7
<i>Willamette River.</i>								
Albany, Oreg. ....	99	30	21.2	13	5.5	29, 30	9.9	15.7
Portland, Oreg. ....	10	15	15.0	3	5.8	23	9.5	9.2
<i>Sacramento River.</i>								
Red Bluff, Cal. ....	241	23	12.3	15	3.2	13	5.3	9.1
Sacramento, Cal. ....	70	29	22.2	21-23	18.0	11	20.5	4.2

\* Distance to Gulf of Mexico.

<sup>1</sup> Frozen after the 13th.<sup>2</sup> Frozen after the 28th.<sup>3</sup> Frozen after the 19th.<sup>4</sup> Frozen after the 14th.<sup>5</sup> Frozen after the 15th.<sup>6</sup> Frozen after the 20th.<sup>7</sup> Frozen after the 27th.<sup>8</sup> Frozen after the 30th.<sup>9</sup> Frozen after the 9th.<sup>10</sup> Frozen after the 17th.<sup>11</sup> Frozen after the 4th.<sup>12</sup> Frozen on the 31st.<sup>13</sup> Frozen after the 29th.<sup>14</sup> For 24 days only.<sup>15</sup> Gage carried away on the 4th.

## CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Rainfall is expressed in inches.

**Alabama.**—The mean temperature was 45.0°, or 2.2° below normal; the highest was 79°, at Uniontown on the 13th, and the lowest, 12°, at Oneonta on the 5th. The average precipitation was 5.80, or 2.00 above normal; the greatest monthly amount, 8.49, occurred at Florence, and the least, 3.41, at Highland Home.

Some slight damage to wheat and oats by freeze of 3d to 7th.—*F. P. Chaffee.*

**Arizona.**—The mean temperature was 46.7°, or 1.4° below normal; the highest was 95°, at Ariaca on the 2d, and the lowest, 1° below zero, at Flagstaff on the 21st. The average precipitation was 0.16, or 0.34 below normal; the greatest monthly amount, 1.60, occurred at Fort Apache, while none fell at a number of stations.—*W. G. Burns.*

**Arkansas.**—The mean temperature was 41.0°, or 2.4° below normal; the highest was 74°, at Camden on the 1st, at Prescott on the 2d, and at Luna Landing on the 7th, and the lowest, 8°, at Winslow on the 15th. The average precipitation was 4.08, or 0.11 below normal; the greatest monthly amount, 6.46, occurred at Mossville, and the least, 1.20, at Prescott.

The greater portion of wheat was sown late, but the weather has been favorable during the month, and the crop is in excellent condition.—*E. B. Richards.*

**California.**—The mean temperature for the State, obtained by weighting the reports from 269 stations, so that equal areas have about the same weight, was 45.8°, which was 0.4° below the December normal for the State, as determined from 188 records; the highest was 96°, at Irvine, Orange County, on the 24th; the lowest, 17° below zero, at Bodie, Mono County, on the 19th. The average precipitation for the State, as determined by the records of 288 stations, was 3.03; the deficiency, as indicated by reports from 200 stations, which have normals, was 0.87; the greatest monthly amount, 16.23, occurred at La Porte, Plumas County, and the least, trace, at several stations in southern California.—*Alexander G. McAdie.*

**Colorado.**—The mean temperature was 24.9°, or 1.0° below normal; the highest was 68°, at Trinidad on the 1st, 25th, and 26th, and the lowest, 42° below zero, at Troutvale on the 14th. The average precipitation was 0.90, or nearly normal; the greatest monthly amount, 2.80, occurred at Ruby, and the least, 0.06, at Saguache.—*F. H. Brandenburg.*

**Florida.**—The mean temperature was 59.2°, or nearly normal; the highest was 84°, at Nocatee on the 12th, 15th, and 16th, and the lowest,

23°, at McClenny on the 30th. The average precipitation was 2.07, or slightly below normal; the greatest monthly amount, 6.05, occurred at Pensacola, and the least, 0.58, at Myers and Orange City.—*A. J. Mitchell.*

**Georgia.**—The mean temperature was 45.0°, or 3.8° below normal; the highest was 80°, at Jesup and Maury on the 19th, and the lowest, 8°, at Dahlonga on the 30th. The average precipitation was 3.44, or 0.34 below normal; the greatest monthly amount, 6.56, occurred at Greenbush, and the least, 0.85, at Hephzibah.—*J. B. Marbury.*

**Idaho.**—The mean temperature was 25.8°, or 1.4° above normal; the highest was 61°, at Garnet on the 8th, and the lowest, 32° below zero, at Chesterfield on the 21st. The average precipitation was 1.65, or 0.30 below normal; the greatest monthly amount, 5.34, occurred at Murray, and the least, 0.37, at Garnet.—*S. M. Blandford.*

**Illinois.**—The mean temperature was 29.2°, or 1.7° below normal; the highest was 66°, at Centralia on the 1st, and the lowest, 8° below zero, at Scales Mound on the 30th. The average precipitation was 2.33, or about normal; the greatest monthly amount, 5.27, occurred at Raum, and the least, 1.17, at La Harpe.

Wheat is short in acreage in all northern and most central counties, but large acreage is reported in the southern district; little snow protection has been given the plant thus far, but it is generally strong and vigorous; the hessian fly seems to be about the only damaging cause.—*C. E. Linney.*

**Indiana.**—The mean temperature was 30.6°, or 2.2° below normal; the highest was 65°, at Vevay on the 1st and at Edwardsville on the 11th, and the lowest, 11° below zero, at Richmond on the 16th. The average precipitation was 3.16, or 0.38 above normal; the greatest monthly amount, 5.90, occurred at Vevay, and the least, 1.51, at Hammond.

During the cold nights in the middle of the month the ground was well covered with snow, but during the last week of the month, when very cold weather prevailed, the fields were bare, and it is feared the freezing and thawing injured the wheat, except in the eastern and southern portions, where it was protected by snow. In some fields, especially in the southern portion, the wheat never looked better; it is well rooted, green, and healthy. In other fields it looks brown and is apparently in bad condition. The hessian fly is injuring the early sown in many fields.—*C. F. R. Wappenhans.*

**Iowa.**—The mean temperature for December was 22.6°, or about 1.0° below normal; the highest was 75°, at Belknap on the 22d, and the lowest, 19° below zero, at Ruthven on the 31st. The mean temperature for the year was 47.6, or 0.2 above normal for the past decade. The average precipitation for December was 1.61, or slightly above normal; the greatest monthly amount, 4.28, occurred at Monticello, and the least, 0.10, at Clearlake. The average precipitation for the year was 29.10, or about 1.0 below normal for the past decade. The greatest

yearly amount, 42.06, occurred at Fort Madison, and the least, 21.79, at Plover.—*J. R. Sage, Director; G. M. Chappel, Assistant.*

**Kansas.**—The mean temperature was 31.4°, or 2.7 below normal; the highest was 73°, at Emporia and Norwich on the 9th, and the lowest, 12° below zero, at Coolidge on the 15th. The average precipitation was 1.22, or 0.08 above normal; the greatest monthly amount, 3.95, occurred at Chanute, and the least, 0.15, at Winona.

Wheat is in good condition, much of it fine, especially in central and southern counties. The early sown in northwestern counties not killed by drought is improving, and late sown is doing well.—*T. B. Jennings.*

**Kentucky.**—The mean temperature was 34.8°, or 3.4° below normal; the highest was 70°, at Jackson on the 11th and 12th, and at Catlettsburg and Warfield on the 12th, and the lowest, 15° below zero, at Eubank on the 31st. The average precipitation was 4.26, or 0.92 above normal; the greatest monthly amount, 6.22, occurred at Mount Hermon, and the least, 2.43, at Canton.

Favorable weather conditions prevailed during the month. Wheat is in excellent condition in nearly all parts of the State, and never looked more promising at this time of year. Some fields have been attacked by the hessian fly, but the damage is generally slight and appears only in few localities.—*H. B. Hersey.*

**Louisiana.**—The mean temperature was 51.1°, or 1.0° below normal; the highest was 87°, at Southern University Farm on the 26th, and the lowest, 20°, at Oakridge on the 6th, and at Mansfield and Plain Dealing on the 16th. The average precipitation was 5.57, or 1.51 above normal; the greatest monthly amount, 10.87, occurred at Rayne, and the least, 2.79, at New Orleans.—*W. T. Blythe.*

**Maryland and Delaware.**—The mean temperature was 36.0°, or 0.6° below normal; the highest was 69°, at Cumberland, Md., on the 8th, and the lowest, 6° below zero, at Sunnyside, Md., on the 31st. The average precipitation was 1.80, or 1.02 below normal; the greatest monthly amount, 4.63, occurred at Sunnyside, Md., and the least, 0.80, at Pocomoke, Md.—*F. J. Wals.*

**Michigan.**—The mean temperature was 26.1°, or normal; the highest was 64°, at Allegan on the 11th and at Reed City on the 12th, and the lowest, 26° below zero, at Iron River on the 30th. The average precipitation was 2.40, or 0.27 above normal; the greatest monthly amount, 5.39, occurred at Vandalia, and the least, 0.14, at Menominee.—*C. F. Schneider.*

**Minnesota.**—The mean temperature was 17.9°, or 1.7° above normal; the highest was 63°, at Lake Jennie on the 9th, and the lowest, 25° below zero, at Pokegama on the 30th. The average precipitation was 0.95, or 0.17 above normal; the greatest monthly amount, 4.05, occurred at Caledonia, and the least, 0.10, at Beardsley.

In the lumber region an almost entire absence of snow has interfered with lumbering operations.—*T. S. Outram.*

**Mississippi.**—The mean temperature was 45.9°, or 2.3° below normal; the highest was 79°, at Americus on the 19th, and the lowest, 13°, at Ripley on the 5th. The average precipitation was 6.33, or 2.15 above normal; the greatest monthly amount, 11.42, occurred at Port Gibson, and the least, 3.34, at Pearlinton.—*H. E. Wilkinson.*

**Missouri.**—The mean temperature was 30.3°, or 3.6° below normal; the highest was 72°, at Wylie on the 2d, and the lowest, 13° below zero, at Edwards on the 15th. The average precipitation was 2.11, or 0.23 below normal; the greatest monthly amount, 6.10, occurred at New Madrid, and the least, 0.69, at Willowsprings.

In the central and northern portions of the State the weather during December was, on the whole, very favorable for wheat, the ground being covered with snow during the coldest weather, and at the close of the month the crop was generally reported in excellent condition, but in portions of the southern sections it is feared that considerable damage resulted from the severe freezing weather of the last decade of the month, the covering of snow in those sections being too light to afford much protection.—*A. E. Hackett.*

**Montana.**—The mean temperature was 23.4°, or normal; the highest was 80°, at Crow Agency on the 24th, and the lowest, 30° below zero, at Glasgow on the 18th. The average precipitation was 0.95, or 0.11 below normal; the greatest monthly amount, 2.57, occurred at Troy, and the least, 0.01, at Dell.—*E. J. Glass.*

**Nebraska.**—The mean temperature was 25.5°, or 0.3° below normal; the highest was 66°, at Lexington on the 1st, and the lowest, 20° below zero, at Valentine on the 14th. The average precipitation was 0.84, or 0.15 above normal; the greatest monthly amount, 2.25, occurred at Clatonia, and the least, 0.08, at Imperial.—*G. A. Loveland.*

**Nevada.**—The mean temperature was 28.0°, or about 2.3° below normal; the highest was 68°, at Verdi on the 1st, and the lowest, 25° below zero, at Fenelon on the 19th. The average precipitation was 0.15, or about 0.22 below normal; the greatest monthly amount, 5.46, occurred at Lewers Ranch, and the least, 0.07, at Mill City.—*J. H. Smith.*

**New England.**—The mean temperature was 30.4°, or 2.7° above normal; the highest was 68°, at Enosburg Falls, Vt., on the 12th, and at Provincetown, Mass., on the 24th, and the lowest, 16° below zero, at Enosburg Falls, Vt., on the 30th. The average precipitation was 2.10, or 1.41 below normal; the greatest monthly amount, 3.42, occurred at Eastport, Me., and the least, 0.93, at Provincetown, Mass.—*J. W. Smith.*

**New Jersey.**—The mean temperature was 35.5°, or 1.8° above normal; the highest was 69°, at Beverly on the 11th, and the lowest, 1° below

zero, at Belvidere on the 31st. The average precipitation was 2.11, or 1.00 below normal; the greatest monthly amount, 4.30, occurred at Charlotteburg, and the least, 1.29, at Vineland.—*E. W. McGann.*

**New Mexico.**—The mean temperature was 36.3°, or 1.2° above normal; the highest was 77°, at Roswell on the 2d, and the lowest, 7° below zero, at Winsors on the 14th. The average precipitation was 0.46, or 0.42 below normal; the greatest monthly amount, 1.80, occurred at Bell Ranch, while Espanola and Strauss recorded none, and Deming, Fort Bayard, Fort Union, and Lordsburg only a trace.—*R. M. Harding.*

**New York.**—The mean temperature was 29.1°, or 1.4° above normal; the highest was 66°, at Poughkeepsie on the 12th, and the lowest, 25° below zero, at North Lake on the 31st. The average precipitation was 3.40, or 0.31 above normal; the greatest monthly amount, 7.72, occurred at Watertown, and the least, 0.89, at Poughkeepsie.

The weather was mild and favorable for wheat and rye, which are reported in excellent condition at the close of the month.—*R. G. Allen.*

**North Carolina.**—The mean temperature was 40.3°, or 2.1° below normal; the highest was 75°, at Southport on the 19th, and the lowest, 5° below zero, at Linville on the 31st. The average precipitation was 2.94, or 0.80 below normal; the greatest monthly amount, 10.55, occurred at Highlands, and the least, 0.92, at Mount Airy.

Wheat was generally reported in excellent condition to stand the winter.—*C. F. von Herrmann.*

**North Dakota.**—The mean temperature was 12.8°, or 0.3° below normal; the highest was 60°, at Power on the 23d, and the lowest, 26° below zero, at Gallatin on the 4th. The average precipitation was 0.30, or 0.21 below normal; the greatest monthly amount, 0.80, occurred at Coal Harbor, and the least, trace, at Ellendale and Forman.—*B. H. Bronson.*

**Ohio.**—The mean temperature was 30.2°, or 2.2° below normal; the highest was 69°, at Portsmouth on the 11th, and the lowest, 7° below zero, at Bangorville and Ridgeville Corners on the 30th, and at Hanging Rock on the 30th and 31st. The average precipitation was 3.16, or 0.49 above normal; the greatest monthly amount, 7.60, occurred at Ashtabula, and the least, 1.84, at Dupont.

Except in a few of the northwestern and north-central counties, the condition of wheat is generally unfavorable. The weather favored the growth the first part of the month, and in places the late sown improved in prospect, and the earliest seeded was recovering from the effects of the hessian fly by tillering and gaining in strength. But for the most part correspondents report the plant in poor condition to stand the winter weather. The late sown is small, and the balance is greatly weakened by the hessian fly.—*J. Warren Smith.*

**Oklahoma.**—The mean temperature was 38.7°, or slightly below normal; the highest was 79°, at Ryan on the 2d, and the lowest, 2° below zero at Beaver on the 15th. The average precipitation was 1.84; the greatest monthly amount, 3.61, occurred at Fort Sill, and the least, 0.20, at Beaver.

Snow afforded a fair protection to the winter wheat.—*C. M. Strong.*

**Oregon.**—The mean temperature, was 38.7°, or about 0.5 above normal; the highest was 68°, at Toledo on the 25th, and the lowest, 9° below zero, at Vale on the 20th. There was no marked cold spells in the section west of the Cascades; one of considerable severity prevailed over the Plateau district from the 14th to the 27th. The average precipitation was 6.30, or about 0.50 below normal; there was a deficiency west of the Cascades, and up the Columbia River Valley, while there was an excess in southwest Oregon and over the Plateau district, the latter being mostly in the form of snow. No snow fell in the western section, except close to the mountains; the greatest monthly amount, 18.48, occurred at Glenora, and the least, 0.48, at Prineville.—*G. N. Salisbury.*

**Pennsylvania.**—The mean temperature was 31.5°, or 0.3° above normal; the highest was 73°, at Lancaster on the 12th, and the lowest, 11° below zero, at Smethport on the 30th. The average precipitation was 3.04, or 0.18 below normal; the greatest monthly amount, 6.00, occurred at Warren, and the least, 1.18, at York.

Until the last week in December the weather conditions were favorable for the growth of winter grain. There being no protection by snow some fields were injuriously affected by alternate freezing and thawing, caused by cold nights and warm days.—*T. F. Townsend.*

**South Carolina.**—The mean temperature was 44.6°, or 2.3 below normal; the highest was 79°, at Beaufort on the 19th, and the lowest, 11°, at Walhalla on the 29th and 30th, at Greenville on the 30th and 31st, and at Spartanburg on the 31st. The average precipitation was 2.33, or 0.45 below normal; the greatest monthly amount, 4.05, occurred at Batesburg, and the least, 0.85, at Charleston.

Wheat and oats were in excellent condition to winter, and were not materially injured by alternate freezing and thawing. Few, if any, hessian flies noticed.—*J. W. Bauer.*

**South Dakota.**—The mean temperature was 18.8°, or about 3° below normal; the highest was 70°, at Forest City on the 1st, and the lowest, 26° below zero, at La Delle, Spink County, on the 31st. The average precipitation was 0.41, or about 0.47 below normal; the greatest monthly amount, 1.14, occurred at Silver City, while none fell at Gary.—*S. W. Glenn.*

**Tennessee.**—The mean temperature was 37.5°, or 3.5° below normal; the highest was 72°, at Waynesboro, and the lowest, 11° below zero, at

Bristol on the 31st. The average precipitation was 4.90, or 1.01 above normal; the greatest monthly amount, 12.03, occurred at Iron City, and the least, 2.01, at Newport.

The weather was, on the whole, favorable to wheat. The plant generally has good stands, is well rooted and stooled. In some eastern counties of the middle section considerable injury to early wheat by fly is reported, but altogether the prospect for wheat was better at the end of December than for many years.—*H. C. Bats.*

*Texas.*—The mean temperature, determined by comparison of 39 stations distributed throughout the State, was 1.8° below the normal; there was a general deficiency ranging from 1.0 to 3.8, with the greatest over the extreme western portion of southwest Texas; the highest was 90°, at Jasper on the 9th, and the lowest, 11°, at Amarillo on the 14th. The average precipitation, determined by comparison of 43 stations distributed throughout the State, was 1.25 above the normal; There was a slight deficiency over the eastern portion of north Texas, nearly normal conditions prevailed over the panhandle, west Texas, and the extreme western portion of the coast district, while over the other portions of the State there was a general excess ranging from about 1.00 to 4.23, with greatest in the vicinity of Huntsville. The greatest monthly amount, 8.06, occurred at Huntsville, and the least, 0.21, at El Paso.

The ground has been in good condition for plowing, and a great deal of this work has been done preparatory for planting spring crops. There is, however, a great deal of plowing yet to be done. There was too much rain for winter wheat in a few localities, otherwise the weather has been exceptionally favorable for the crop. Seeding was completed during the early part of December and good stands and rapid growth are reported generally. Some correspondents report that wheat prospects are better at this season than for years. Early sown has grown very rapidly and is being pastured. The acreage sown is not as great as it would have been had the weather been more favorable for this work during October and November, but the acreage is generally good.—*J. L. Okine.*

*Utah.*—The mean temperature was 25.2°, or 1.5° below normal; the

highest was 74°, at Elgin on the 1st, and the lowest, 26° below zero, at Scipio on the 19th. The average precipitation was 0.95, or 0.04 below normal; the greatest monthly amount, 2.35, occurred at Soldier Summit, and the least, a trace, at Frisco and Pahreah.—*L. H. Murdoch.*

*Virginia.*—The mean temperature was 37.0°, or about 2.0° below normal; the highest was 73°, at Blacksburg on the 12th, and the lowest, 11° below zero, at Marion on the 31st. The average precipitation was 2.00, or 0.98 below normal; the greatest monthly amount, 4.06, occurred at Burkes Garden, and the least, 0.18, at Newport News.

The progress of the crops throughout the month was unusually favorable.—*E. A. Evans.*

*Washington.*—The mean temperature was 37.3°, or 2.7° above normal, the highest was 71°, at Bridgeport on the 9th, and the lowest, 2° below zero, at Waterville on the 18th and at Hooper on the 19th. The average precipitation was 4.79, or 0.97 below normal; the greatest monthly amount, 22.16, occurred at Clearwater, and the least, 0.58, at Ellensburg.—*A. B. Wollaber.*

*West Virginia.*—The mean temperature was 33.3°, or about 2.0° below normal; the highest was 77°, at Nuttallburg on the 22d, and the lowest, 17° below zero, at Green Sulphur Springs on the 31st. The average precipitation was 2.81, or 0.22 below normal; the greatest monthly amount, 4.46, occurred at Central Station, and the least, 1.22, at Parsons.—*E. C. Vose.*

*Wisconsin.*—The mean temperature was 21.2°, or slightly above normal; the highest was 58°, at Sharon on the 8th, and the lowest, 20° below zero, at Butternut on the 29th. The average precipitation was 1.62, or 0.36 above normal; the greatest monthly amount, 2.80, occurred at Whitehall, and the least, 0.40, at Lincoln.—*W. M. Wilson.*

*Wyoming.*—The mean temperature was 21.1°, or 2.3° below normal; the highest was 68°, at Cody on the 25th, and the lowest, 29° below zero, at Bittercreek on the 21st. The average precipitation was 0.69, or nearly normal; the greatest monthly amount, 1.90, occurred at Centennial and at Fort Yellowstone, and the least, trace, at Cody.—*W. S. Palmer.*

## SPECIAL CONTRIBUTIONS.

### RECENT PAPERS BEARING ON METEOROLOGY.

W. F. R. PHILLIPS, in charge of Library, etc.

The subjoined list of titles has been selected from the contents of the periodicals and serials recently received in the library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau:

*Science.* New York. Vol. 10.

Olayden, A. W. Dark lightning. P. 973.

*Quarterly Journal of Royal Meteorological Society.* London. Vol. 25.

Dickson, H. N. Mean Temperature of the Surface Waters of Sea round British Coasts and its relation to Mean Temperature of the Air. P. 227.

Schaw, H. Some Phenomena connected with the Vertical Circulation of the Atmosphere. P. 305.

Scott, R. H. Heavy Falls of Rain recorded at seven Observatories connected with the Meteorological Office, 1871-1898. P. 317.

Baxendell, J. New Self-recording Anemoscope. P. 326.

Mossman, R. C. Average Height of the Barometer in London. P. 330.

*Das Wetter.* Berlin. 16 Jahrg.

Kassner, O. Wogenwolken. P. 265.

Wirz, — Beiträge zur Klimatologie des Grossen Belchen (1394 m. Höhe). P. 283.

*Geographische Zeitschrift.* Leipzig. 5 Jahrg.

Meinardus, W. Meteorologie und Klimatologie. Der VII internationale Geographenkonferenz zu Berlin. P. 692.

*Journal de Physique.* Paris. 3me série. Tome 8.

Folgheraiter, — Sur les variations séculaires de l'inclinaison magnétique dans l'antiquité. P. 660.

*Philosophical Magazine.* London. Vol. 49.

Davison, Charles. Earthquake Sounds. P. 31.

*La Nature.* Paris. 28me Année.

Meriel, P. de. Le cyclone des Antilles. P. 107.

Plumandon, J. R. Le froid dans la France centrale. P. 93.

*Scientific American.* New York. Vol. 82.

— How a Weather Map is Made. P. 38.

*Comptes Rendus.* Paris. Tome 129.

Poincare, A. Mouvements barométriques provoqués, sur le méridien du Soleil, par sa marche en déclinaison. P. 1290.

*Scientific American Supplement.* New York. Vol. 49.

Bryan, G. H. Resistance of the Air. P. 20116.

*Ciel et Terre.* Bruxelles. 20me Année.

Arctowski, H. Rapport préliminaire sur les recherches océanographiques de l'Expédition antarctique belge. P. 503.

Dewert, J. L'hiver de 1740. P. 508.

*Annalen der Hydrographie und Maritimen Meteorologie.* Hamburg. 28 J.

Messerschmitt, J. B. Ueber die Halophänomene. P. 32.

*Bollettino Mensuale, Soc. Met. Italiana.* Turin. Ser. II. Vol. 9.

Roberts, G. I Vortici. P. 47.

*Terrestrial Magnetism and Atmospheric Electricity.* Baltimore. Vol. 4.

Elster, J. and Geitel, H. Ueber die Existenz elektrischen Ionen in der Atmosphäre. P. 213.

Tillo, Alexis de. Sur la répartition qui existe entre la répartition des éléments magnétiques et la distribution général des mers et de la température moyenne annuelle à la surface du globe. P. 237.

Luedeling, G. Ueber die tägliche Periode des Erdmagnetismus und der erdmagnetischen Störungen an Polarstationen. P. 245.

### RATIO OF THE DISCHARGES OF THE CHAGRES RIVER AT GAMBOA AND BOHIO TO THE RAINFALL IN THE WATERSHED ABOVE THESE PLACES.

By HENRY L. ARBOT, U. S. A., Engineer of the New Panama Canal Co., dated Paris, December 9, 1899.

In my note on the regimen of the Chagres River there is an almost complete collection of the monthly mean discharges, in cubic meters per second, as measured during seven years at Gamboa and Bohio. These values are here given in Tables 1 and 2. A few observations that are missing have been supplied by the figures in brackets which also enter into the mean values of the summary, except for April, 1893, at Bohio, where, because of the small flood which occurred there at that time, we have adopted ten-sevenths (1.48) of the corresponding discharge measured at that time at Gamboa.